» User Guide «

AM5030 uEFI BIOS

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If it’s embedded, it’s Kontron.

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Table of Contents

Revision History ..... *ii*
Imprint ..... *ii*
Disclaimer ..... *ii*
Table of Contents ..... *iii*

1. Starting uEFI BIOS Setup* *3

1.1 Main Setup Menu *4*
1.2 Navigation *5*

2. Main Setup* *9

2.1 BIOS Information *9*
2.2 Memory Information *9*
2.3 System Language *10*
2.4 System Date *10*
2.5 System Time *10*
2.6 Access Level *10*

3. Advanced Setup* *13

3.1 Trusted Computing *14*
3.1.1 TPM Configuration *14*
3.1.1.1 TPM Support *14*
3.2 USB Configuration *15*
3.2.1 USB Configuration *15*
3.2.2 Legacy USB Support *15*
3.2.3 EHCI Hand-Off *16*
3.2.4 USB Transfer Timeout *16*
3.2.5 Device Reset Timeout *16*
3.2.6 Device Power Delay *17*
3.2.7 Mass Storage Devices *17*
3.3 Serial Port Console Redirection *18*
3.3.1 COM0 ..... *18*

3.3.1.1 Console Redirection 18
3.3.1.2 Console Redirection Settings 18
3.3.2 COM4 19
3.3.2.1 Console Redirection 19
3.3.2.2 Console Redirection Settings 19
3.3.3 Serial Port for Out-of-Band Management/Windows EMS 19
3.3.3.1 Console Redirection 19
3.3.3.2 Out-of-Band Mgmt Port 19
3.3.3.3 Data Bits 19
3.3.3.4 Parity 20
3.3.3.5 Stop Bits 20
3.3.3.6 Terminal Type 20
3.3.4 Console Redirection Settings 21
3.3.4.1 Terminal Type 21
3.3.4.2 Bits per second 21
3.3.4.3 Data Bits 22
3.3.4.4 Parity 22
3.3.4.5 Stop Bits 22
3.3.4.6 Flow Control 22
3.3.4.7 Resolution 100x31 22
3.3.4.8 Legacy OS Redirection 22

4. Chipset Setup 25
4.1 Intel® VT for Directed I/O Configuration 26
4.1.1 Intel(R) VT-d 26
4.1.2 Interrupt Remapping 27
4.1.3 Coherency Support 27
4.1.4 ATS Support 27
4.1.5 Pass-through DMA 28
4.2 NorthBridge Configuration 29

5. Boot Setup 33
5.1 Boot Configuration 33

5.1.1 Quiet Boot 33
5.1.2 Fast Boot 34
5.1.3 Setup Prompt Timeout 34
5.1.4 Bootup NumLock State 34
5.1.5 CSM16 Module Version 34
5.1.6 GateA20 Active 34
5.1.7 Option ROM Messages 35
5.1.8 Interrupt 19 Capture 35
5.2 Boot Option Priorities 36
5.2.1 Boot Option #1..2 36
5.2.2 Hard Drive/Network Device/CD/DVD ROM Drive/etc. 36
5.2.3 Add New Boot Option 36
5.2.4 Delete Boot Option 36

6. Security Setup 39

6.1 Administrator Password 40
6.2 User Password 40
6.3 Remember the Password 40

7. Save & Exit 43

7.1 Save Changes and Exit 43
7.2 Discard Changes and Exit 43
7.3 Save Changes and Reset 43
7.4 Discard Changes and Reset 44
7.5 Save Changes (Save Options) 44
7.6 Discard Changes (Save Options) 44
7.7 Restore Defaults (Save Options) 44
7.8 Save as User Defaults (Save Options) 44
7.9 Restore User Defaults (Save Options) 44
7.10 Boot Override 44

8. The uEFI Shell 47

8.1 Introduction, Basic Operation 47
8.1.1 Shell Startup 47
8.2 Kontron Shell Commands 48
8.3 uEFI Shell Scripting 62
8.3.1 Startup Scripting 62
8.3.2 Create a Startup Script 62
8.3.3 Examples of Startup Scripts 62
8.3.3.1 Automatic Booting from USB Memory Stick 62
8.3.3.2 Switch On Clock Spreading Prior to Booting from Harddrive 62
8.3.3.3 Execute Shell Script on Other Harddrive 62

9. Updating the uEFI BIOS 65
9.1 BIOS Redundancy Strategy 65
9.2 Updating Strategy 65
9.3 Fallback Mechanism 65
9.4 Flash Selection by IPMI Command 65
9.5 Flash Selection by DIP Switch 66
9.6 Determining the Active Flash 66

Chapter 1

Starting uEFI BIOS Setup

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1. Starting uEFI BIOS Setup

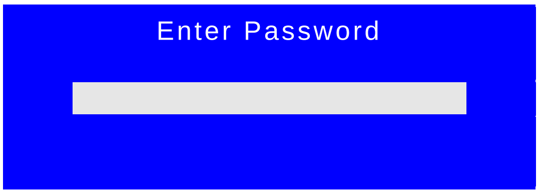
The AM5030 is provided with a Kontron-customized, pre-installed and configured version of Aptio® (referred to as uEFI BIOS in this manual), AMI's next generation BIOS firmware based on the Unified Extensible Firmware Interface (uEFI) specification and the Intel® Platform Innovation Framework for EFI. This uEFI BIOS provides a variety of new and enhanced functions specifically tailored to the hardware features of the AM5030. This user guide reflects the uEFI BIOS version R12.

To take advantage of these functions, the uEFI BIOS comes with a Setup program which provides quick and easy access to the individual function settings for control or modification of the uEFI BIOS configuration.

The Setup program allows the accessing of various menus which provide functions or access to sub-menus with more specific functions of their own. The individual menus and the configurable functions are described in this guide.

To start the uEFI BIOS Setup program, follow the steps below:

1. Power on the board.
2. Wait until the first characters appear on the screen (POST messages or splash screen).
3. Press the <F2> key.
4. If the uEFI BIOS is password-protected, a window such as the one below will appear:



Enter Password

Enter either the User password or the Administrator password (refer to Chapter 6, Security Setup, for further information), press <RETURN>, and proceed with step 2.

5. A Setup menu with the following token attributes will appear.
   The currently active menu and the currently active uEFI BIOS Setup item are highlighted in white.

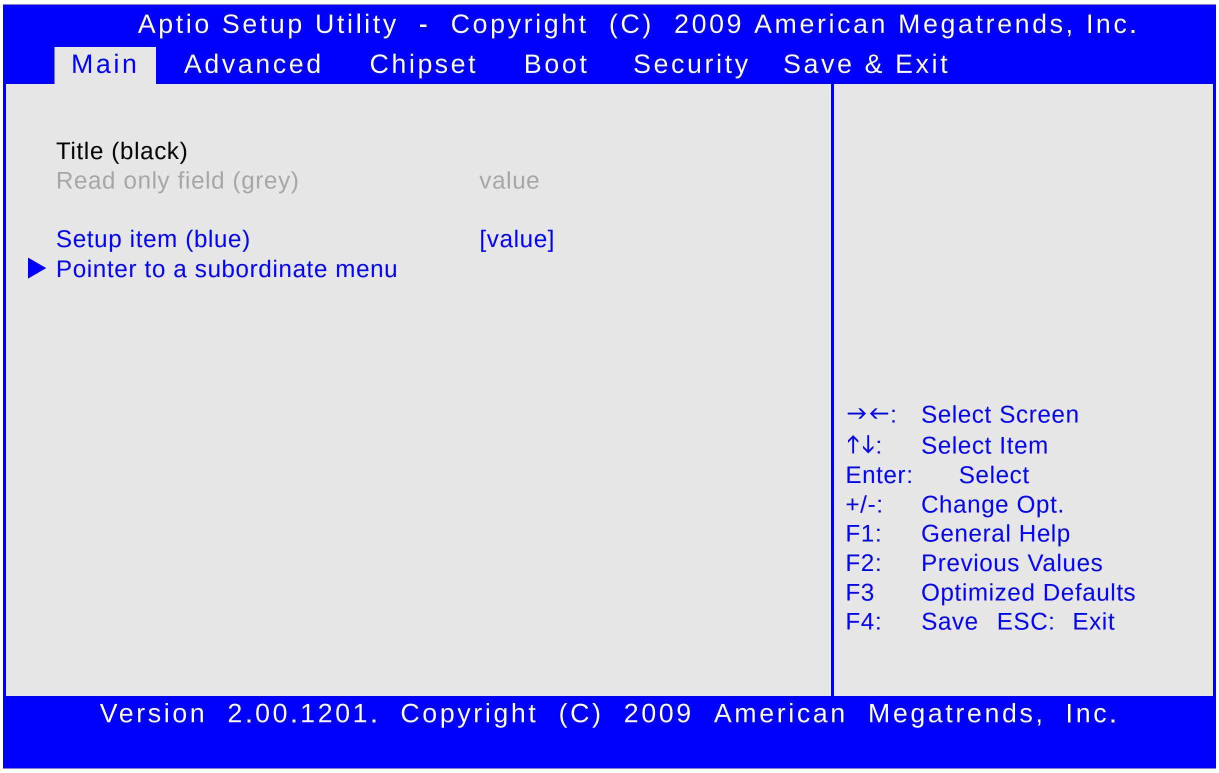
1.1 Main Setup Menu

The Main setup menu is the first screen that appears after starting the Setup program.

At the top of this screen and all of the other major screens, there is a setup menu selection bar, which permits access to all of the other major setup menus. These menus are selected via the left-right arrow keys.

All setup menu screens have two main frames. The left frame displays all the functions that can be configured. They are displayed in blue. Functions displayed in gray provide information about the status or the operational configuration.

The right frame displays the key legend. Above the key legend there is an area reserved for a text message. When a function is selected in the left frame, it is displayed in white. Often a text message will accompany it.



```
        Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
    Main   Advanced   Chipset   Boot   Security   Save & Exit

   Title (black)
   Read only field (grey)            value

   Setup item (blue)                 [value]
 ▶ Pointer to a subordinate menu


                                                    →←:   Select Screen
                                                    ↑↓:   Select Item
                                                    Enter:    Select
                                                    +/-:  Change Opt.
                                                    F1:   General Help
                                                    F2:   Previous Values
                                                    F3    Optimized Defaults
                                                    F4:   Save  ESC:  Exit

     Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.
```

1.2 Navigation

The AM5030 uEFI BIOS setup program uses a hot key-based navigation system. A hot key legend is located in the right frame on most setup screens.The following table provides information concerning the usage of these hot keys.

HOT KEY	DESCRIPTION
<F1>	The <F1> key is used to invoke the General Help window.
<F2>	The <F2> key is used to restore the previous values.
<F3>	The <F3> key is used to load the defaults.
<F4>	The <F4> key is used to save the current settings and exit the uEFI BIOS Setup.
→ ← Left/Right	The *Left and Right* <Arrow> keys are used to select a major Setup screen. For example: Main Screen, Advanced Screen, Chipset Screen, etc.
↑ ↓ Up/Down	The *Up and Down* <Arrow> keys are used to select a Setup function or a sub-screen.
+ - Plus/Minus	The *Plus and Minus* <Arrow> keys are used to change the field value of a particular Setup function, for example, system date and time.
<ESC>	The <ESC> key is used to exit a menu or the uEFI BIOS Setup. Pressing the <ESC> key in a sub-menu causes the next higher menu level to be displayed. When the <ESC> key is pressed in a major Setup menu, the uEFI BIOS Setup is terminated without saving any changes made.
<Enter>	The <Enter> key is used to execute a command or select a menu.

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Chapter 2

Main Setup

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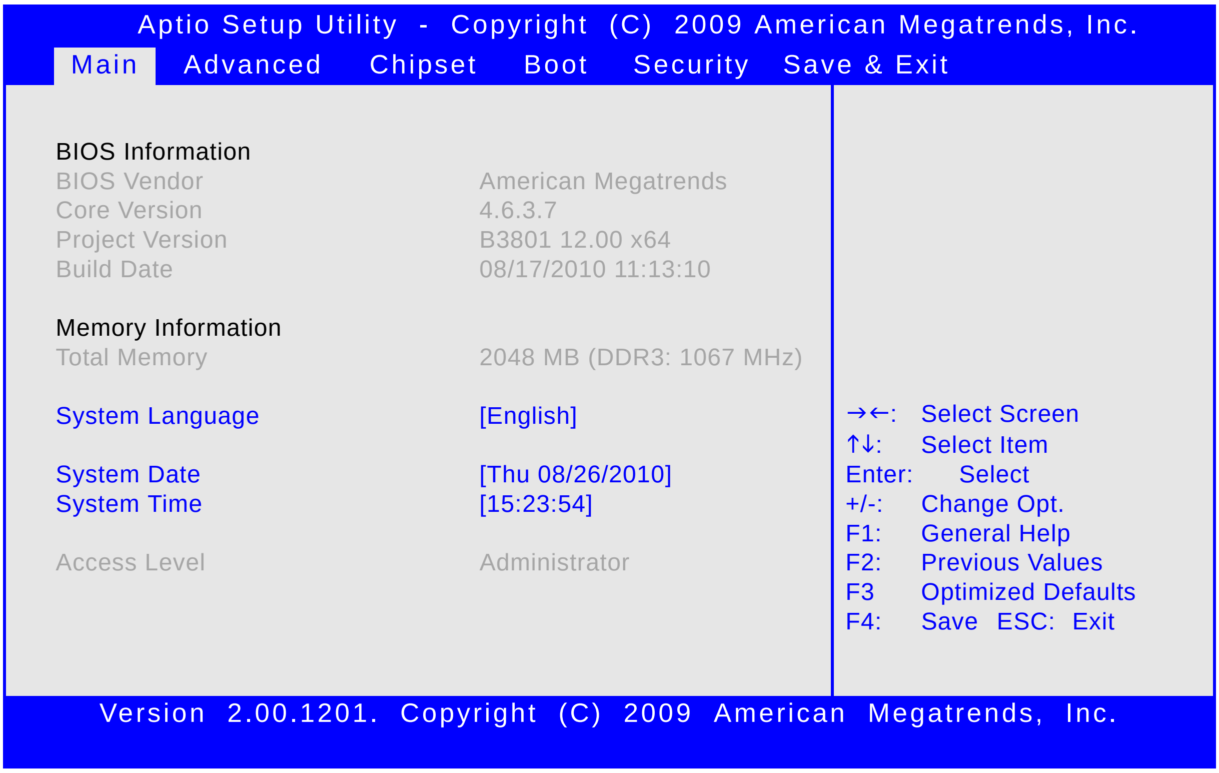
2. Main Setup

Upon entering the uEFI BIOS Setup program, the Main setup screen is displayed. This screen lists the main setup sub-screens and provides very basic system information as well as functions for setting the system time and date. In addition, the remaining major setup menus can be accessed from this screen. This screen can also be selected from any other major setup screen by using the Main tab.



```
Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
  Main   Advanced   Chipset   Boot   Security   Save & Exit

BIOS Information
BIOS Vendor                  American Megatrends
Core Version                 4.6.3.7
Project Version              B3801 12.00 x64
Build Date                   08/17/2010 11:13:10

Memory Information
Total Memory                 2048 MB (DDR3: 1067 MHz)

System Language              [English]              →←:    Select Screen
                                                    ↑↓:    Select Item
System Date                  [Thu 08/26/2010]       Enter:   Select
System Time                  [15:23:54]             +/-:   Change Opt.
                                                    F1:    General Help
Access Level                 Administrator          F2:    Previous Values
                                                    F3     Optimized Defaults
                                                    F4:    Save  ESC:  Exit

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```

2.1 BIOS Information

This function provides display-only information concerning the uEFI BIOS.

2.2 Memory Information

This function provides display-only information concerning the system memory.

2.3 System Language

SETTING	DESCRIPTION
English	Use this function to select the system language. Currently, only English is supported.

2.4 System Date

SETTING	DESCRIPTION
<MM/DD/YYYY>	Use this function to change the system date. Select System Date using the Up and Down <Arrow> keys. Enter the new values through the keyboard. Press the Left and Right <Arrow> keys to move between fields.

2.5 System Time

SETTING	DESCRIPTION
<HH:MM:SS>	Use this function to change the system time. Select System Time using the Up and Down <Arrow> keys. Enter the new values through the keyboard. Press the Left and Right <Arrow> keys to move between fields.

Note: The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.

2.6 Access Level

This function provides display-only information concerning the uEFI BIOS Setup accessibility for the current Setup session. Depending on the type of password protection used, one of the following settings is displayed:

SETTING	DESCRIPTION
Administrator	This setting indicates that read/write access to all setup options is available.
User	This setting indicates that only a limited subset of all setup options is modifiable.

Note: If no password is set, the access setup is Administrator.

Chapter 3

Advanced Setup

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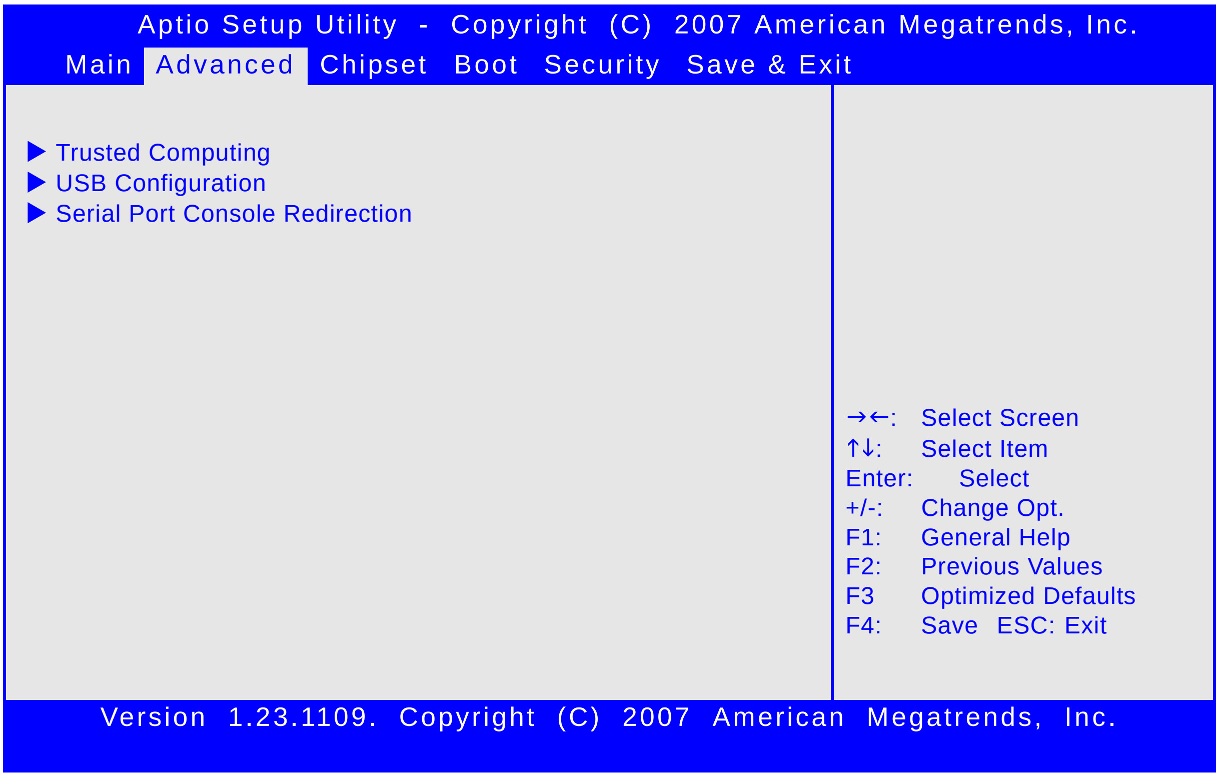
3. Advanced Setup

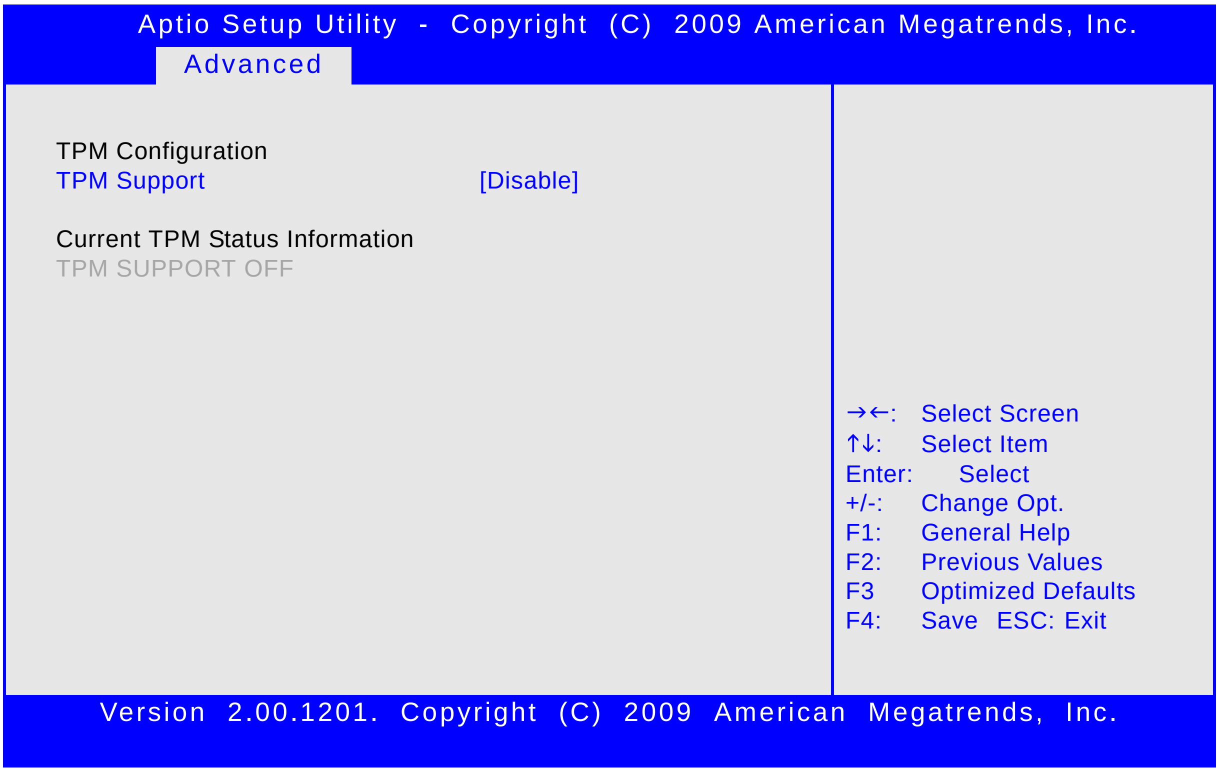
Select the Advanced tab to enter the Advanced Setup screen. This screen lists the advanced configuration sub-screens.



```
Aptio Setup Utility - Copyright (C) 2007 American Megatrends, Inc.
Main  Advanced  Chipset  Boot  Security  Save & Exit

▶ Trusted Computing
▶ USB Configuration
▶ Serial Port Console Redirection

                                   →←:    Select Screen
                                   ↑↓:    Select Item
                                   Enter:    Select
                                   +/-:   Change Opt.
                                   F1:    General Help
                                   F2:    Previous Values
                                   F3     Optimized Defaults
                                   F4:    Save  ESC: Exit

Version 1.23.1109. Copyright (C) 2007 American Megatrends, Inc.
```

3.1 Trusted Computing

This screen provides functions for specifying the TPM configuration settings and TPM displaying status information.



```
        Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
              Advanced

   TPM Configuration
   TPM Support                         [Disable]

   Current TPM Status Information
   TPM SUPPORT OFF

                                                        →←:    Select Screen
                                                        ↑↓:    Select Item
                                                        Enter:    Select
                                                        +/-:   Change Opt.
                                                        F1:    General Help
                                                        F2:    Previous Values
                                                        F3     Optimized Defaults
                                                        F4:    Save  ESC: Exit

       Version 2.00.1201. Copyright (C) 2009 American Megatrends, Inc.
```

3.1.1 TPM Configuration

3.1.1.1 TPM Support

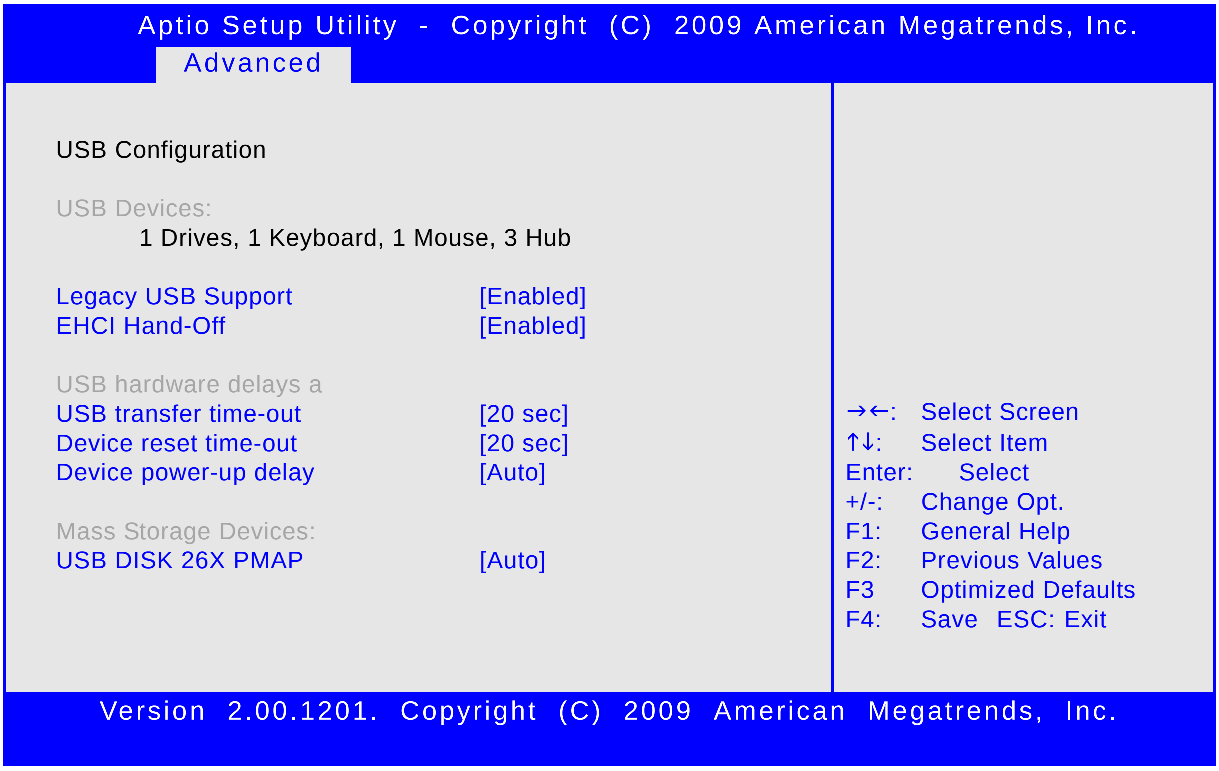
This function is used to provide the Trusted Platform Module (TPM) functionality to the OS.

SETTING	DESCRIPTION
Disable	Use this setting to disable TPM support. If this setting is used, the TPM is not present for the OS, regardless whether the function TPM State is enabled or not.
Enable	Use this setting to enable TPM support.

Default setting: Disable

3.2 USB Configuration

This screen provides information about support for USB devices as well as functions for specifying the USB configuration settings.



```
Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
     Advanced

USB Configuration

USB Devices:
        1 Drives, 1 Keyboard, 1 Mouse, 3 Hub

Legacy USB Support                  [Enabled]
EHCI Hand-Off                       [Enabled]

USB hardware delays a
USB transfer time-out               [20 sec]
Device reset time-out               [20 sec]        →←:   Select Screen
Device power-up delay               [Auto]          ↑↓:   Select Item
                                                    Enter:   Select
Mass Storage Devices:                               +/-:  Change Opt.
USB DISK 26X PMAP                   [Auto]          F1:   General Help
                                                    F2:   Previous Values
                                                    F3    Optimized Defaults
                                                    F4:   Save  ESC: Exit

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```

3.2.1 USB Configuration

This is a display-only function providing general information about the USB devices detected.

3.2.2 Legacy USB Support

This function is required for booting from USB devices and for operating systems which do not support USB themselves (mainly DOS and some BootLoaders).

SETTING	DESCRIPTION
Disabled	Use this setting to disable legacy USB support.
Enabled	Use this setting to enable legacy USB support.
Auto	Use this setting to enable legacy USB support if there are USB devices present.

Default setting: Enabled

3.2.3 EHCI Hand-Off

This function is used to enable a workaround for operating systems without EHCI Hand-Off support. The EHCI ownership change should be claimed by the EHCI driver.

Note: It is recommended to leave this function at the default setting.
For operating systems without USB2.0 support this function must be left at the default setting.

SETTING	DESCRIPTION
Disabled	Use this setting to disable EHCI Hand-Off support.
Enabled	Use this setting to enable EHCI Hand-Off support.

Default setting: Enabled

3.2.4 USB Transfer Timeout

This setting selects the timeout in seconds that the USB core will wait for a USB Control, Bulk and Interrupt transfer.

SETTING	DESCRIPTION
1 sec 5 sec 10 sec 20 sec	Use one of these settings to specify how long the USB core will wait for a USB Control, Bulk and Interrupt transfer.

Default setting: 20 sec

3.2.5 Device Reset Timeout

This setting selects the timeout in seconds that the USB core will wait for a USB storage device to become ready after start unit command.

SETTING	DESCRIPTION
10 sec 20 sec 30 sec 40 sec	Use one of these settings to specify how long the USB core will wait for a USB mass storage device to become ready after the start unit command.

Default setting: 20 sec

3.2.6 Device Power Delay

SETTING	DESCRIPTION
Auto	Use this setting to automatically select the maximum time the device will take before it properly reports itself to the host controller. The default value for a root port is 100 ms. For a hub port, the delay is taken from the hub descriptor.
Manual	Use this setting to manually select the maximum time the device will take before it properly reports itself to the host controller. The delay range is 1..40 seconds in one second increments.

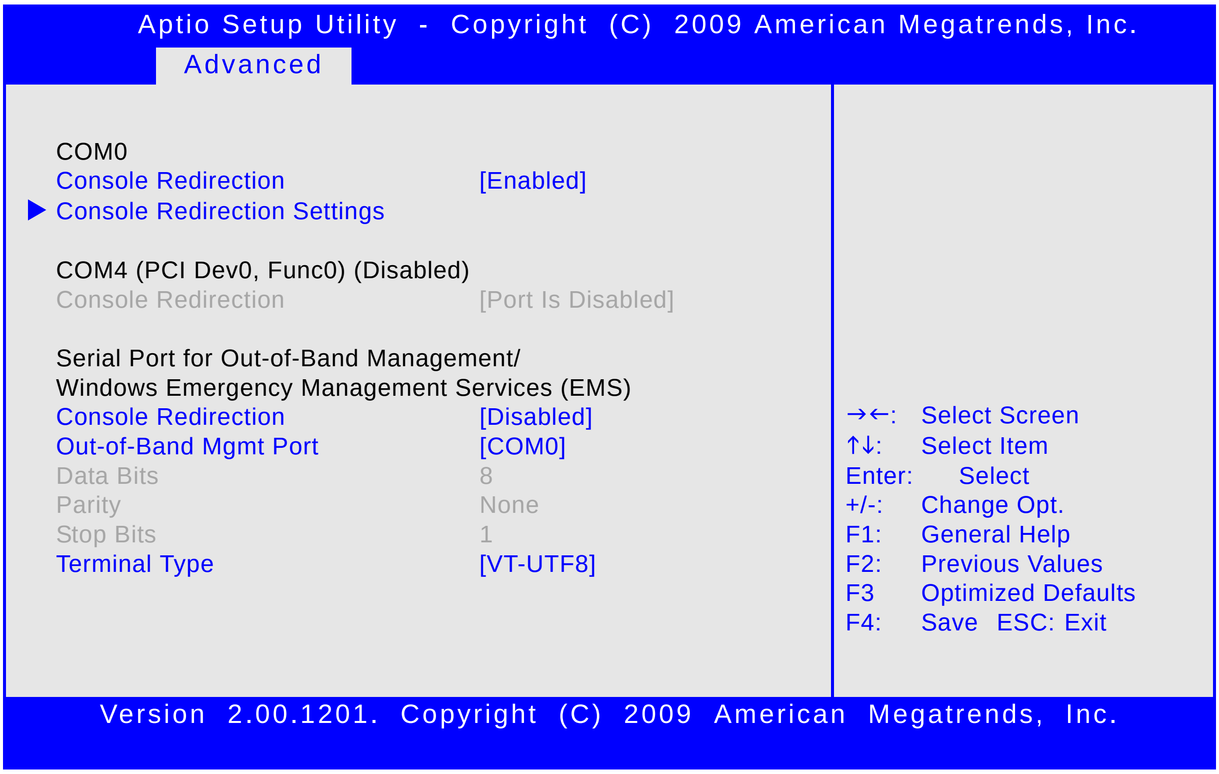
Default setting: Auto

3.2.7 Mass Storage Devices

This function shows a list of connected USB mass storage devices and allows the user to select how the respective device is to be treated.

3.3 Serial Port Console Redirection

This screen provides information about functions for specifying the Serial Port Console Redirection configuration settings. Console redirection can be used to remotely operate system settings and the EFI console.



```
        Aptio Setup Utility  -  Copyright  (C)  2009 American Megatrends, Inc.
            Advanced

  COM0
  Console Redirection                 [Enabled]
▶ Console Redirection Settings

  COM4 (PCI Dev0, Func0) (Disabled)
  Console Redirection                 [Port Is Disabled]

  Serial Port for Out-of-Band Management/
  Windows Emergency Management Services (EMS)
  Console Redirection                 [Disabled]          →←:   Select Screen
  Out-of-Band Mgmt Port               [COM0]              ↑↓:   Select Item
  Data Bits                           8                   Enter:   Select
  Parity                              None                +/-:  Change Opt.
  Stop Bits                           1                   F1:   General Help
  Terminal Type                       [VT-UTF8]           F2:   Previous Values
                                                          F3    Optimized Defaults
                                                          F4:   Save  ESC: Exit

     Version  2.00.1201.  Copyright  (C)  2009  American  Megatrends,  Inc.
```

3.3.1 COM0

The COM0 port (serial port 0) corresponds to the serial port on the front panel of the AM5030.

3.3.1.1 Console Redirection

SETTING	DESCRIPTION
Disabled	Use this setting to disable console redirection for the serial port 0.
Enabled	Use this setting to enable console redirection for the serial port 0.

Default setting: Enabled

3.3.1.2 Console Redirection Settings

For information about this function, refer to Chapter 3.4.4 in this manual.

3.3.2 COM4

COM4 is available only if the MicroTCA system provides a serial port via PCI Express.

3.3.2.1 Console Redirection

SETTING	DESCRIPTION
Disabled	Use this setting to disable console redirection for a PCIe serial port.
Enabled	Use this setting to enable console redirection for a PCIe serial port.

Default setting: Enabled

3.3.2.2 Console Redirection Settings

For information about this function, refer to Chapter 3.4.4 in this manual.

3.3.3 Serial Port for Out-of-Band Management/Windows Emergency Management Services (EMS)

The following functions control the presence and content of the ACPI serial port redirection table (SPCR). This table is mainly used by the Windows server variants to provide Windows Emergency Management Services (EMS). This functionality is totally independent from serial redirection of other console output.

3.3.3.1 Console Redirection

SETTING	DESCRIPTION
Disabled	Use this setting to prevent the system from adding the SPCR table to the ACPI tables.
Enabled	Use this setting to add the SPCR table to the ACPI tables. The OS can further use the information provided for serial redirection services.

Default setting: Disabled

3.3.3.2 Out-of-Band Mgmt Port

This function is used to select the serial port intended for use with Out-of-Band Management. This functionality is independent from serial redirection of other console output.

SETTING	DESCRIPTION
COM0	Use this setting to specify that the serial port 0 is to be used with Out-of-Band Management.
COM4	Use this setting to specify that a PCIe serial port is to be used with Out-of-Band Management.

Default setting: COM0

3.3.3.3 Data Bits

This is a display-only function providing information about the frame width for the Out-of-Band Management.

3.3.3.4 Parity

This is a display-only function providing information about the parity for Out-of-Band Management.

3.3.3.5 Stop Bits

This is a display-only function providing information about the number of stop bits for Out-of-Band Management.

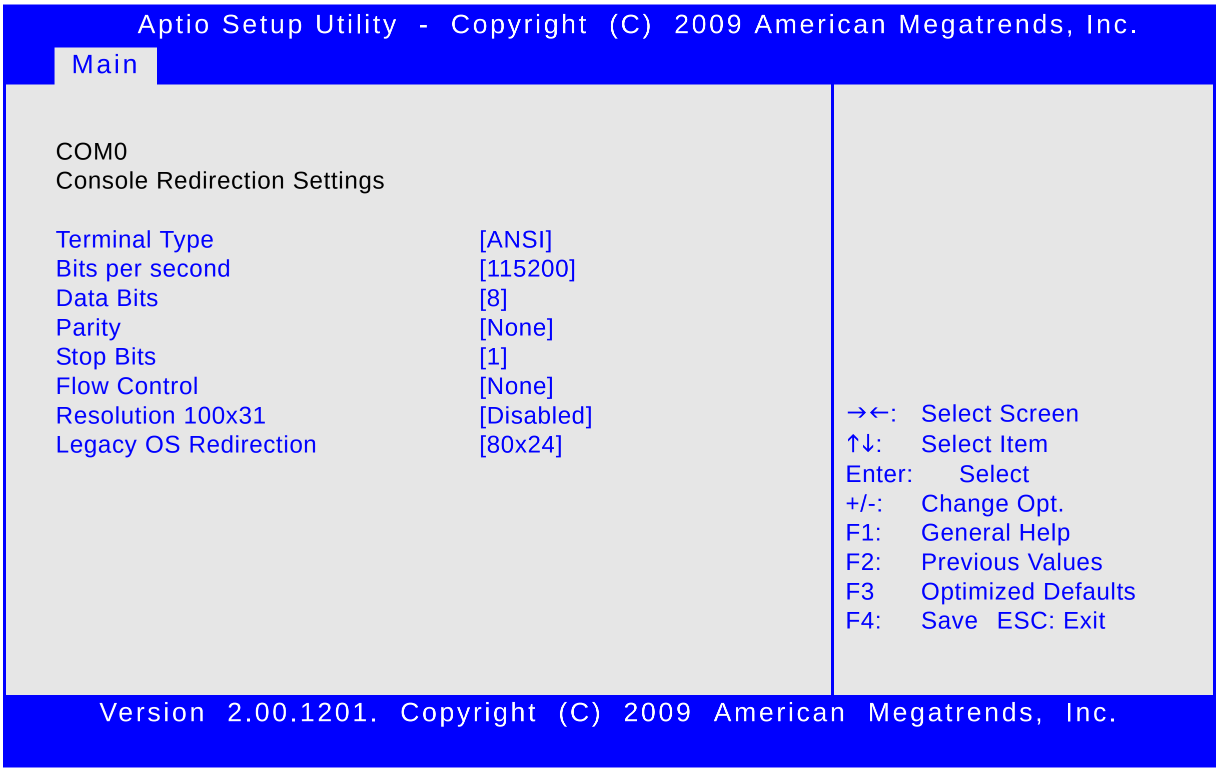
3.3.3.6 Terminal Type

SETTING	DESCRIPTION
VT100	Use one of these settings to select the terminal type for out-of-band management.
VT100+	
VT-UTF8	
ANSI	

Default setting: VT-UTF8

3.3.4 Console Redirection Settings

This screen provides information about functions for specifying the Console Redirection configuration settings for the serial port 0 and a PCIe serial port. Each serial port can be independently configured.



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Main

COM0
Console Redirection Settings

Terminal Type	[ANSI]
Bits per second	[115200]
Data Bits	[8]
Parity	[None]
Stop Bits	[1]
Flow Control	[None]
Resolution 100x31	[Disabled]
Legacy OS Redirection	[80x24]

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3.3.4.1 Terminal Type

SETTING	DESCRIPTION
VT100	Use one of these settings to select the terminal type to be emulated.
VT100+	
VT-UTF8	
ANSI	

Default setting: ANSI

3.3.4.2 Bits per second

SETTING	DESCRIPTION
9600	Use one of these settings to select the baud rate of the serial port.
19200	
57600	
115200	

Default setting: 115200

3.3.4.3 Data Bits

SETTING	DESCRIPTION
7	Use one of these settings to specify the number of data bits per frame.
8	

Default setting: 8

3.3.4.4 Parity

SETTING	DESCRIPTION
None	Use one of these settings to select the parity for the serial port.
Even	
Odd	
Mark	
Space	

Default setting: None

3.3.4.5 Stop Bits

SETTING	DESCRIPTION
1	Use one of these settings to specify the number of stop bits for the serial port.
2	

Default setting: 1

3.3.4.6 Flow Control

SETTING	DESCRIPTION
None	Use one of these settings to specify the type of flow control to be used for this serial port.
Hardware RTS/CTS	

Default setting: None

3.3.4.7 Resolution 100x31

SETTING	DESCRIPTION
Disabled	Use this setting the disable extended terminal resolution.
Enabled	Use this setting the enable extended terminal resolution.

Default setting: Disabled

3.3.4.8 Legacy OS Redirection

SETTING	DESCRIPTION
80x24	Use one of these settings to select the number of rows and columns for legacy OSredirection.
80x25	

Default setting: 80x24

Chapter 4

Chipset Setup

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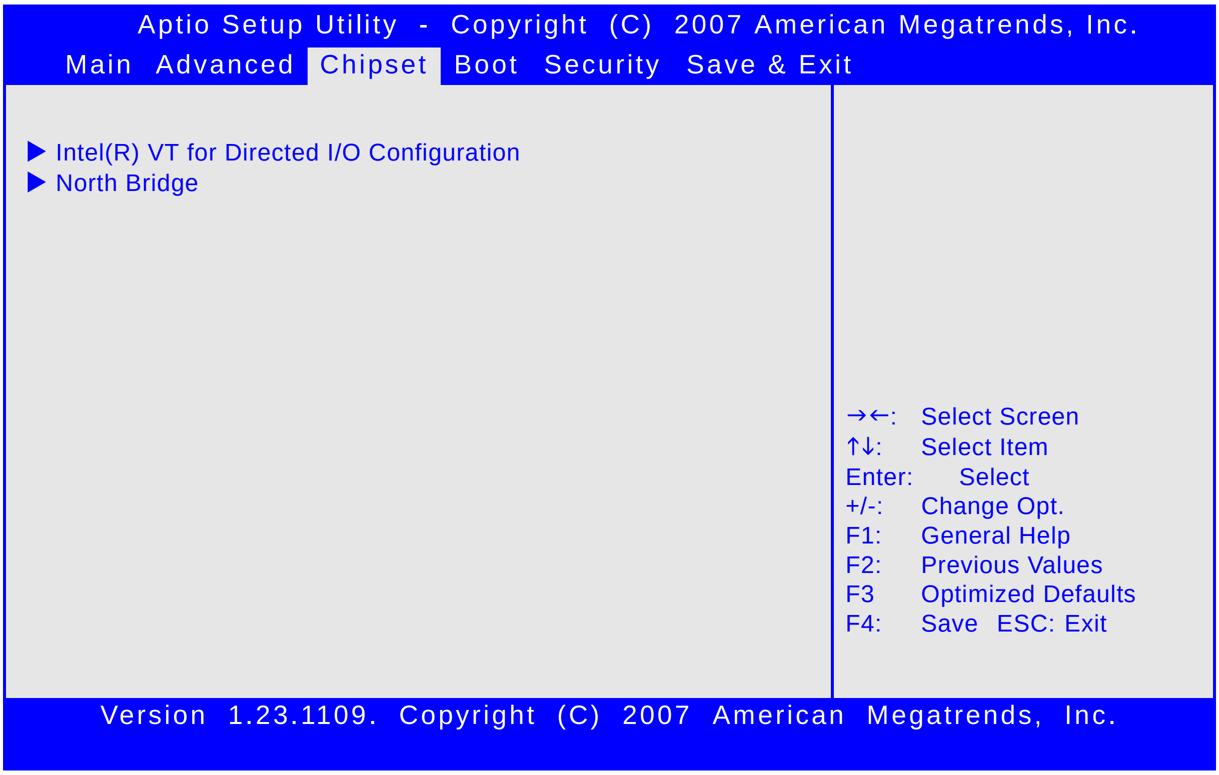
4. Chipset Setup

Select the Chipset tab to enter the Chipset Setup screen. This screen indicates the NorthBridge sub-screen.



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▶ Intel(R) VT for Directed I/O Configuration
▶ North Bridge

```
→←:    Select Screen
↑↓:    Select Item
Enter:      Select
+/-:   Change Opt.
F1:    General Help
F2:    Previous Values
F3     Optimized Defaults
F4:    Save  ESC: Exit
```

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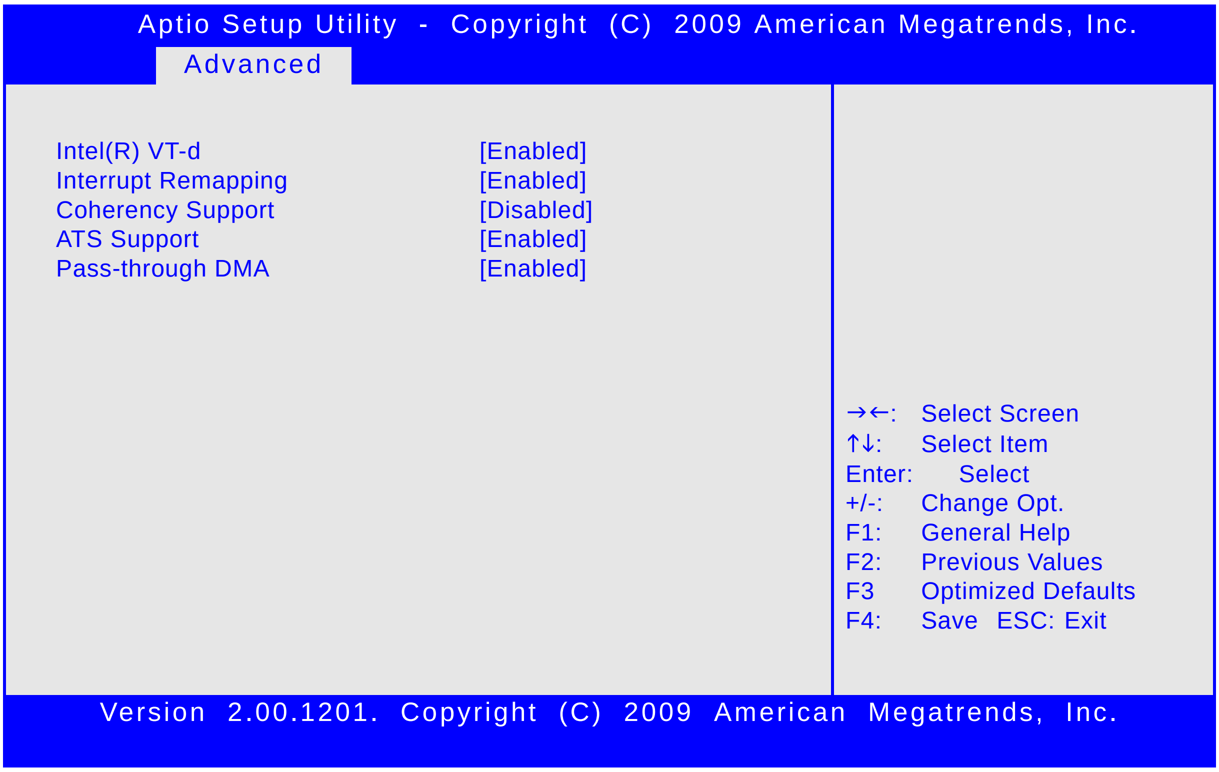
4.1 Intel® VT for Directed I/O Configuration

This screen provides functions for specifying the Intel® VT for Directed I/O configuration settings.



```
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          Advanced

   Intel(R) VT-d                 [Enabled]
   Interrupt Remapping           [Enabled]
   Coherency Support             [Disabled]
   ATS Support                   [Enabled]
   Pass-through DMA              [Enabled]

                                                 →←:    Select Screen
                                                 ↑↓:    Select Item
                                                 Enter:    Select
                                                 +/-:   Change Opt.
                                                 F1:    General Help
                                                 F2:    Previous Values
                                                 F3     Optimized Defaults
                                                 F4:    Save  ESC: Exit

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```

4.1.1 Intel(R) VT-d

This function is used to enable the Intel® Virtualization Technology for Directed I/O (Intel® VT-d) functionality. Intel® VT-d supports remapping of direct memory access (DMA) transfers and device generated interrupts on hardware level, which helps to improve isolation of I/O devices.

SETTING	DESCRIPTION
Disable	Use this setting to disable Intel(R) VT-d support.
Enable	Use this setting to enable Intel(R) VT-d support.

Default setting: Disabled

4.1.2 Interrupt Remapping

This function allows for reductions in interrupt virtualization overhead for assigned devices. Interrupt requests specify a requester ID and an interrupt ID, and remap hardware transforms these requests to a physical interrupt using a software-programmed Interrupt Remap Table structure in memory.

Note: This function is available only when the function Intel(R) VT-d is set to Enabled.

SETTING	DESCRIPTION
Disable	Use this setting to disable Interrupt Remapping.
Enable	Use this setting to enable Interrupt Remapping.

Default setting: Enabled

4.1.3 Coherency Support

This function is used to indicate to the hardware to either snoop or not snoop the DMA / Interrupt table structures in memory (root/context/pd/pt/irt).

Note: This function is available only when the function Intel(R) VT-d is set to Enabled.

SETTING	DESCRIPTION
Disable	Use this setting to disable Coherency Support.
Enable	Use this setting to enable Coherency Support.

Default setting: Disabled

4.1.4 ATS Support

This function is used for keeping VT-D I/O TLB and translation cache in sync from allowed devices. To facilitate scaling of address translation caches, PCI Express protocol extensions (referred to as Address Translation Services) are being standardized by the PCI Special Interest Group (PCI-SIG). ATS consists of a set of PCI transactions that allow the optimization of VT-d address translations These extensions enable I/O devices to request translations from the root complex and for the root complex to return responses for each translation request.

Note: This function is available only when the function Intel(R) VT-d is set to Enabled.

SETTING	DESCRIPTION
Disable	Use this setting to disable ATS Support.
Enable	Use this setting to enable ATS Support.

Default setting: Enabled

4.1.5 Pass-through DMA

This function is used to enable/disable VT-d engine pass-through DMA support. DMA request with untranslated addresses are processed as pass-through and will cause a DMA draining.

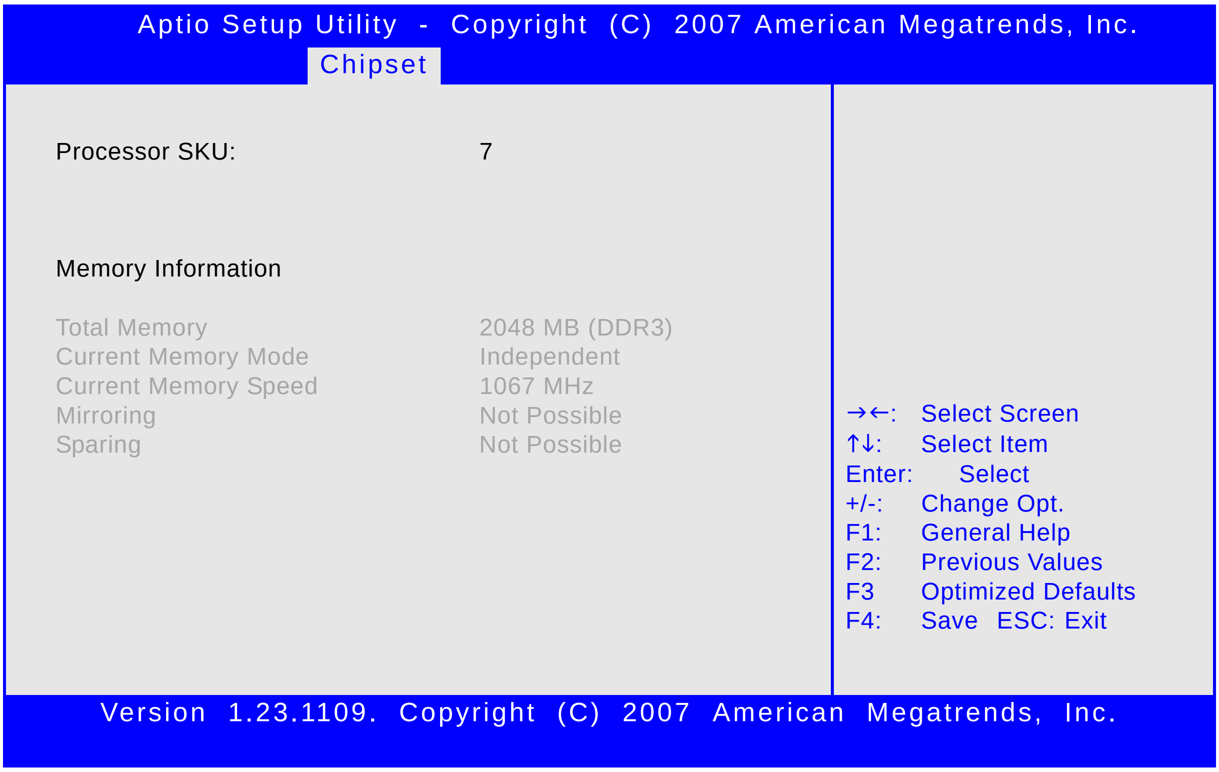
Note: This function is available only when the function Intel(R) VT-d is set to Enabled.

SETTING	DESCRIPTION
Disable	Use this setting to disable Pass-through DMA support.
Enable	Use this setting to enable Pass-through DMA support.

Default setting: Enabled

4.2 NorthBridge Configuration

This screen provides display-only information concerning the memory, which is integrated in the Intel® Xeon® LC5518 processor.



```
Aptio Setup Utility - Copyright (C) 2007 American Megatrends, Inc.
Chipset

Processor SKU:                    7


Memory Information

Total Memory                      2048 MB (DDR3)
Current Memory Mode               Independent
Current Memory Speed              1067 MHz
Mirroring                         Not Possible
Sparing                           Not Possible

→←:     Select Screen
↑↓:     Select Item
Enter:     Select
+/-:    Change Opt.
F1:     General Help
F2:     Previous Values
F3      Optimized Defaults
F4:     Save  ESC: Exit

Version 1.23.1109. Copyright (C) 2007 American Megatrends, Inc.
```

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Chapter 5

Boot Setup

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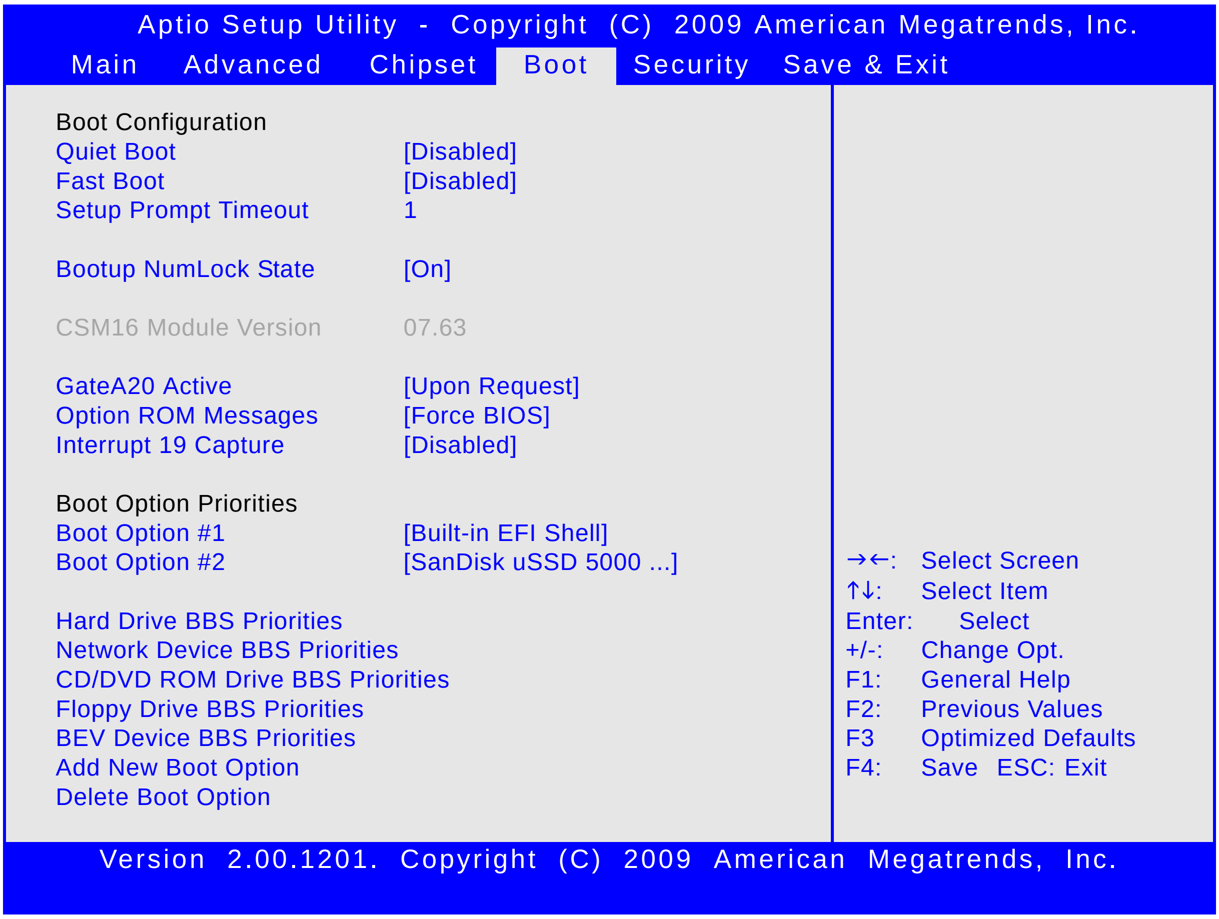
5. Boot Setup

Select the Boot tab to enter the Boot Setup screen. This screen lists the sub-screens for boot configuration and boot device priority.



```
     Aptio Setup Utility  -  Copyright  (C)  2009 American Megatrends, Inc.
  Main    Advanced    Chipset    Boot    Security   Save & Exit

  Boot Configuration
  Quiet Boot                  [Disabled]
  Fast Boot                   [Disabled]
  Setup Prompt Timeout        1

  Bootup NumLock State        [On]

  CSM16 Module Version        07.63

  GateA20 Active              [Upon Request]
  Option ROM Messages         [Force BIOS]
  Interrupt 19 Capture        [Disabled]

  Boot Option Priorities
  Boot Option #1              [Built-in EFI Shell]
  Boot Option #2              [SanDisk uSSD 5000 ...]   →←:   Select Screen
                                                        ↑↓:   Select Item
  Hard Drive BBS Priorities                             Enter:   Select
  Network Device BBS Priorities                         +/-:  Change Opt.
  CD/DVD ROM Drive BBS Priorities                       F1:   General Help
  Floppy Drive BBS Priorities                           F2:   Previous Values
  BEV Device BBS Priorities                             F3    Optimized Defaults
  Add New Boot Option                                   F4:   Save  ESC: Exit
  Delete Boot Option

     Version  2.00.1201.  Copyright  (C)  2009  American  Megatrends,  Inc.
```

5.1 Boot Configuration

5.1.1 Quiet Boot

This function is used to display either POST output messages or a splash screen during boot-up.

SETTING	DESCRIPTION
Disabled	Use this setting to display POST output messages during boot-up.
Enabled	Use this setting to display a splash screen during boot-up.

Default setting: Disabled

5.1.2 Fast Boot

This function is used to enable or disable boot with initialization of a minimal set of devices required to launch active boot option..

SETTING	DESCRIPTION
Disabled	Use this setting to disable fast boot.
Enabled	Use this setting to enable fast boot.

Default setting: Disabled

5.1.3 Setup Prompt Timeout

This integer function is used to set an additional time the POST should wait for the operator to press the key to enter setup. The time is entered in seconds.

SETTING	DESCRIPTION
1 ⋮ 65535	Use one of these settings to specify the setup prompt timeout.

Default setting: 1

5.1.4 Bootup NumLock State

This function is used to set the state of the keyboard’s numlock function after POST.

SETTING	DESCRIPTION
On	Use this setting to switch on the keyboard’s numlock function after POST.
Off	Use this setting to switch off the keyboard’s numlock function after POST.

Default setting: On

5.1.5 CSM16 Module Version

This function provides display-only information concerning the CSM Module and is intended for internal use only.

5.1.6 GateA20 Active

This function is used to enable or disable GateA20.

SETTING	DESCRIPTION
Upon Request	Use this setting to disable GA20 in the uEFI BIOS.
Always	Use this setting to prevent the system from disabling GA20.

Default setting: Upon Request

5.1.7 Option ROM Messages

This function is used to control the messages of the loaded PCI option ROMs.

SETTING	DESCRIPTION
Force BIOS	Use this setting to force to a BIOS-compatible output. This will show the option ROM messages.
Keep Current	Use this setting to keep the current video mode. This will suppress option ROM messages. Option ROMs requiring interactive inputs may not work properly in this mode.

Default setting: Force BIOS

5.1.8 Interrupt 19 Capture

This function is used to specify if legacy PCI option ROMs are allowed to capture software interrupt 19h.

SETTING	DESCRIPTION
Disabled	Use this setting to prevent legacy PCI option ROMs from capturing software interrupt 19h.
Enabled	Use this setting to allow legacy PCI option ROMs to capture software interrupt 19h.

Default setting: Disabled

5.2 Boot Option Priorities

5.2.1 Boot Option #1..2

These functions are used to form the boot order and are dynamically generated. They represent either a legacy BBS (BIOS Boot Specification) class of devices or a native EFI boot entry. Press Return on each option to select the BBS class / EFI boot entry desired.

5.2.2 Hard Drive/Network Device/CD/DVD ROM Drive/Floppy Drive/BEV Device BBS Priorities

These functions lead to sub-menus that allow configuring the boot order for a specific device class. These options are only visible if at least one device for this class is present. These functions are dynamically generated.

5.2.3 Add New Boot Option

This function is used to create a native uEFI boot option. Refer to the user manual for the respective native uEFI operating system further information about creating a boot option.

5.2.4 Delete Boot Option

This function is used to delete a native uEFI boot option. Refer to the user manual for the respective native uEFI operating system further information about deleting a boot option.

Note: Do not delete the “Built-in EFI Shell” boot option as this would remove the uEFI Shell from the boot order. In case the uEFI Shell got removed, use “Save & Exit” / “Boot Override” / “Built-in EFI Shell” to recover.

Chapter 6

Security Setup

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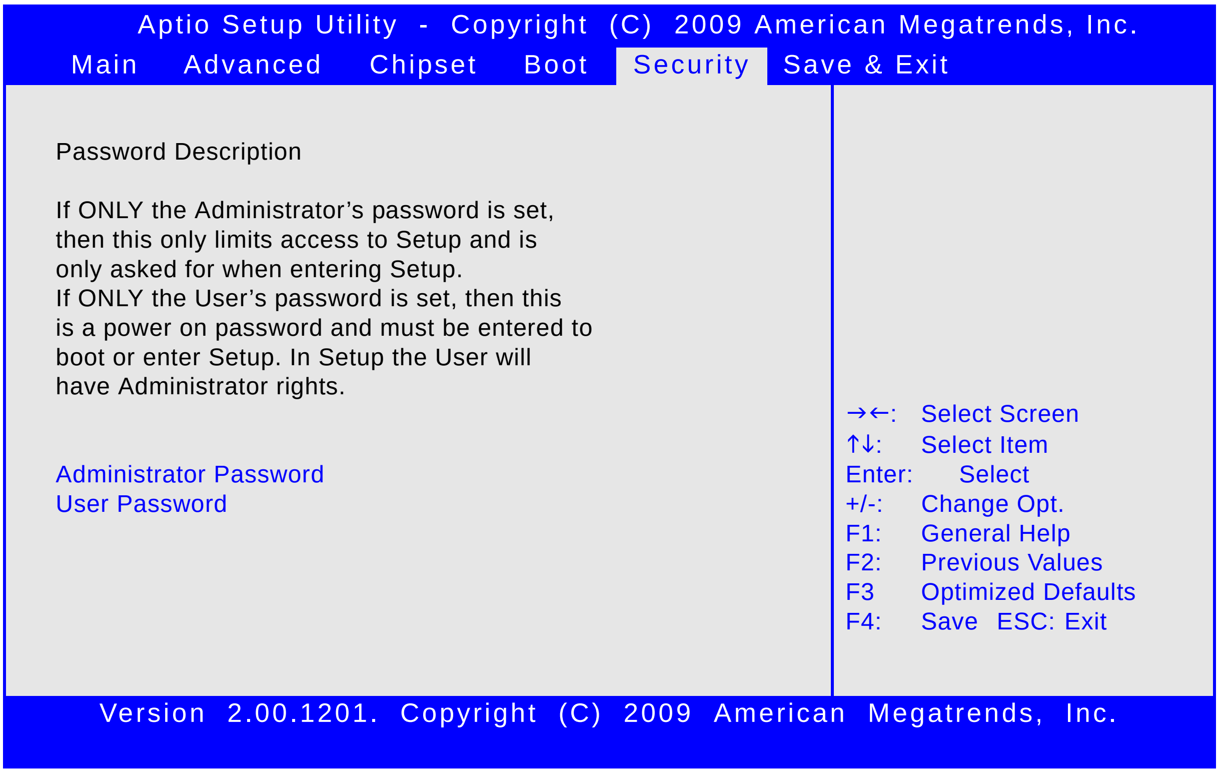
6. Security Setup

Select the Security tab to enter the Security Setup screen. This screen provides information about the passwords and functions for specifying the security settings.



Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.

Password Description

If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup.
If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights.

Administrator Password
User Password

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The following modes of security are provided:.

SETTING	DESCRIPTION
No password is set	Booting the system as well as entering the Setup is unsecured.
Only Administrator password is set	Booting the system is unsecured. For entering the Setup, the Administrator password is required.
Only User password is set	The password is required for booting the system as well as for entering the Setup menu. On every startup, the user will be asked for the password.
Both User and Administrator passwords are set	Booting the system is unsecured. For entering the Setup, a password is required. If the User password is entered here, most of the Setup entries are read only; only entries related to the boot sequence can be modified. Entering the Administrator password provides full access to all Setup entries.

6.1 Administrator Password

This function is used to set, change or delete the Administrator password. If there is already a password installed, the system asks for this first. To clear a password, simply enter nothing and acknowledge by pressing Return. To set a password, enter it twice and acknowledge by pressing Return.

Note: The password is case sensitive.

6.2 User Password

This function is used to set, change or delete the User password. If there is already a password installed, the system asks for this first. To clear a password, simply enter nothing and acknowledge by pressing Return. To set a password, enter it twice and acknowledge by pressing Return.

Note: The password is case sensitive.

6.3 Remember the Password

It is highly recommended to keep a record of all passwords in a safe place. Forgotten passwords may lead to being completely locked out of the system. Booting may not be possible, and in worst case the uEFI BIOS Setup program will also not be accessible.

If the system cannot be booted because neither the User password nor the Administrator password are known, refer to Chapter 4.1 in the AM5030 User Guide for information about clearing the uEFI BIOS settings, or contact Kontron for further assistance.

Chapter 7

Save & Exit

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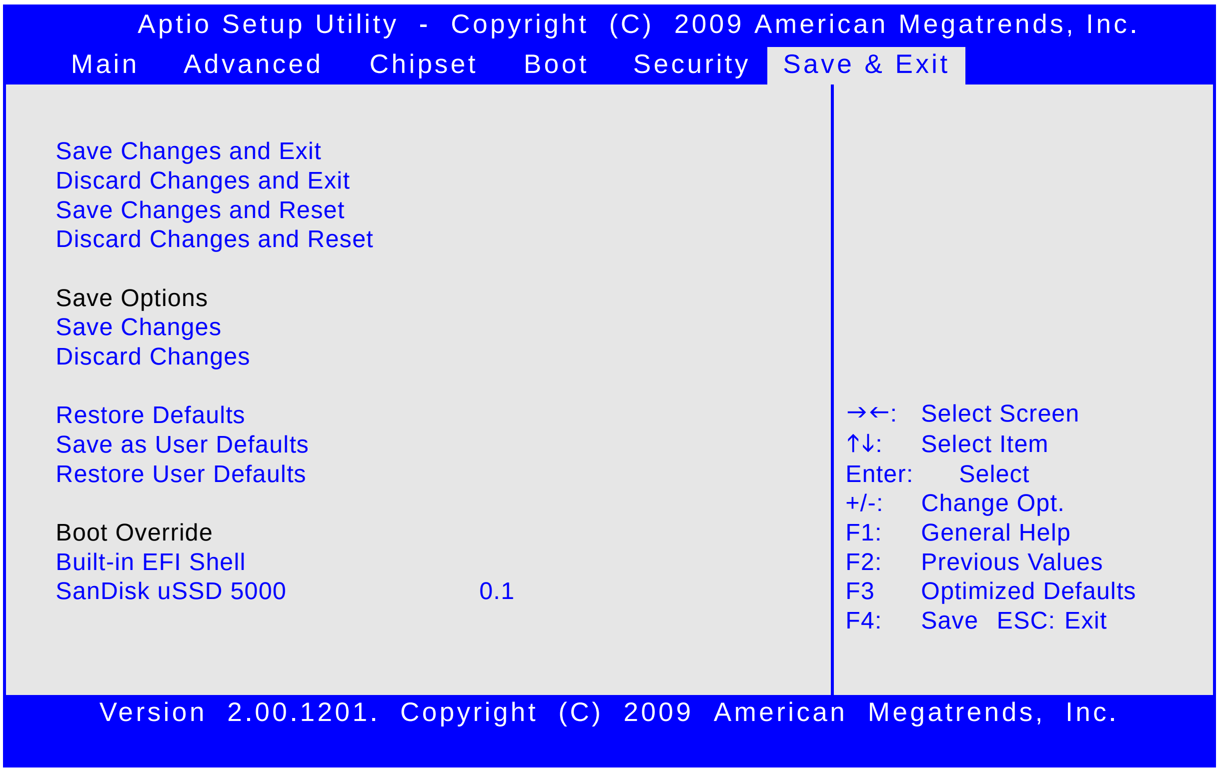
7. Save & Exit

Select the Save & Exit tab to enter the Save & Exit menu screen. This screen provides functions for handling changes made to the uEFI BIOS settings and the exiting of the Setup program.



```
        Aptio Setup Utility  -  Copyright  (C)  2009 American Megatrends, Inc.
    Main    Advanced    Chipset    Boot    Security   Save & Exit

  Save Changes and Exit
  Discard Changes and Exit
  Save Changes and Reset
  Discard Changes and Reset

  Save Options
  Save Changes
  Discard Changes

  Restore Defaults                                   →←:    Select Screen
  Save as User Defaults                              ↑↓:    Select Item
  Restore User Defaults                              Enter:    Select
                                                     +/-:   Change Opt.
  Boot Override                                      F1:    General Help
  Built-in EFI Shell                                 F2:    Previous Values
  SanDisk uSSD 5000                0.1               F3     Optimized Defaults
                                                     F4:    Save  ESC: Exit

       Version  2.00.1201.  Copyright  (C)  2009  American  Megatrends,  Inc.
```

7.1 Save Changes and Exit

This function is used to save all changes made within the Setup to Flash. This function continues the boot process as long as no option was altered that requires a reboot.

Note: The Setup will ask for confirmation prior to executing this command.

7.2 Discard Changes and Exit

This function is used to discard all changes made within the Setup. This function continues the boot process.

Note: The Setup will ask for confirmation prior to executing this command.

7.3 Save Changes and Reset

This function is used to save all changes made within the Setup to Flash. This function performs a reboot afterwards.

Note: The Setup will ask for confirmation prior to executing this command.

7.4 Discard Changes and Reset

This function is used to discard all changes made within the Setup. This function performs a reboot afterwards.

Note: The Setup will ask for confirmation prior to executing this command.

7.5 Save Changes (Save Options)

This function is used to save all changes made within the Setup to Flash. This function returns to Setup.

Note: The Setup will ask for confirmation prior to executing this command.

7.6 Discard Changes (Save Options)

This function is used to discard all changes made within the Setup. This function returns to Setup.

Note: The Setup will ask for confirmation prior to executing this command.

7.7 Restore Defaults (Save Options)

This function is used to restore all tokens to factory default.

Note: The Setup will ask for confirmation prior to executing this command.

7.8 Save as User Defaults (Save Options)

This function is used to save all current settings as user default. The current setup state can later be restored using Restore User Defaults.

Note: The Setup will ask for confirmation prior to executing this command.

7.9 Restore User Defaults (Save Options)

This function is used to restore all tokens to settings previously stored by Save as User Defaults.

Note: The Setup will ask for confirmation prior to executing this command.

7.10 Boot Override

This group of functions includes a list of tokens, each of them corresponding to one device within the boot order. Select a drive to immediately boot that device regardless of the current boot order. If booting to EFI Shell this way, an exit from the shell returns to Setup.

Chapter 8

The uEFI Shell

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8. The uEFI Shell

The Kontron uEFI BIOS features a built-in and enhanced version of the uEFI Shell. For a detailed description of the available standard shell scripting refer to the EFI Shell User's Guide. For a detailed description of the available standard shell commands, refer to the Shell Command Manual 1.0. Both documents can be downloaded from the EFI and Framework Open Source Community homepage (https://efi-shell.tianocore.org) under the "Documents and Files" section.

Please note that not all shell commands described in the Shell Command Manual 1.0 are provided by the Kontron uEFI BIOS.

8.1 Introduction, Basic Operation

The uEFI Shell forms an entry into the uEFI boot order and is the first boot option by default. It is simply started by putting the uEFI Shell first in boot and running the board as usual.

8.1.1 Shell Startup

If the shell is executed, it displays its signon message followed by a list of detected devices. The output produced by the device mapping table can vary depending on the board's configuration.

```
EFI Shell version 2.00 [4.637]
Current running mode 1.1.2
Device mapping table
  fs0     :Removable HardDisk - Alias hd33b0b0b blk0
           Acpi(PNP0A03,0)/Pci(1D|7)/Usb(1, 0)/Usb(1, 0)/HD(Part1,Sig17731773)
  fs1     :Removable BlockDevice - Alias f33b0c0 blk1
           Acpi(PNP0A03,0)/Pci(1D|7)/Usb(1, 0)/Usb(2, 0)
  blk0    :Removable HardDisk - Alias hd33b0b0b fs0
           Acpi(PNP0A03,0)/Pci(1D|7)/Usb(1, 0)/Usb(1, 0)/HD(Part1,Sig17731773)
  blk1    :Removable BlockDevice - Alias f33b0c0 fs1
           Acpi(PNP0A03,0)/Pci(1D|7)/Usb(1, 0)/Usb(2, 0)
  blk2    :HardDisk - Alias (null)
           Acpi(PNP0A03,0)/Pci(1F|2)/Ata(Primary,Master)/HD(Part1,SigC811D18D)
  blk3    :BlockDevice - Alias (null)
           Acpi(PNP0A03,0)/Pci(1F|2)/Ata(Primary,Master)
  blk4    :Removable BlockDevice - Alias (null)
           Acpi(PNP0A03,0)/Pci(1D|7)/Usb(1, 0)/Usb(1, 0)

Press the ESC key within 5 seconds to skip startup.nsh, and any other key to
continue.
```

If the ESC key is pressed before the 5-second timeout has elapsed, the shell prompt is shown:

```
Shell>
```

8.2 Kontron Shell Commands

The Kontron uEFI implementation provides the following additional commands related to the specific HW features of the Kontron system:

- **kboardconfig**
- **kboardinfo**
- **kboot**
- **kbootnsh**
- **kclearnvram**
- **kclsp**
- **kipmi**
- **kmkramdisk**
- **kpassword**
- **kwdt**

The following tables provide information concerning these Kontron-specific commands. The command response values indicated can vary depending on the board’s configuration.

kboardconfig

FUNCTION: Configure the non-volatile board settings

SYNTAX:

```
kboardconfig

kboardconfig [-?|<device>|<setting>]
```

where:

?	Show online help
<device>	Specify device from list
<setting>	Select configuration type

DESCRIPTION: The **kboardconfig** command enables the PXE feature or sets the front/ rear I/O configuration of the dedicated device.

USAGE: Show all possible configurations

COMMAND / RESPONSE:

```
Shell> kboardconfig
Control nonvolatile board settings
Example: kboardconfig
hyperThreading: Enable Hyper Threading technology (disabled
[enabled])
pxe: config ([disabled] all gbe_a gbe_b amc_a amc_b xaui_a xaui_b)
sataMode: SATA controller config (disabled [ide] ahci raid)
amcport_2: SATA Port config ([e-keying] forced_on)
amcport_3: SATA Port config ([e-keying] forced_on)
amcport_12: SATA Port config ([e-keying] forced_on)
amcport_13: SATA Port config ([e-keying] forced_on)
storageOrom: Launch Storage PCI OpROM (disabled [enabled])
vga: VGA Port Configuration (disabled [enabled])
bootvideo: Select preferred boot video device (amc [onboard])
wr_prot_eeprom: System EEprom write protection ([disabled]
enabled)
wr_prot_sata: Onboard Sata flash write protection ([disabled]
enabled)
wr_prot_spi: EFI spi flash write protection ([disabled] enabled)
```

Show allowed settings e.g. for “bootvideo”:

```
Shell> kboardconfig bootvideo
bootvideo: Select preferred boot video device
bootvideo == onboard
Allowed options: amc, onboard
```

SETTINGS `hyperThreading:` Enable/Disable Hyper-Threading Technology

kboardconfig

SETTINGS:	pxe: Select PXE boot network adapter disabled: No PXE boot available [all]: Try all Ethernet devices round robin for PXE boot gbe_a: Try only front port a for PXE boot gbe_b: Try only front port b for PXE boot amc_a: Try only AMC port a for PXE boot amc_b: Try only AMC port b for PXE boot xaui_a: Try only XAUI port a for PXE boot xaui_b: Try only XAUI port b for PXE boot
	SATAMode: Determines how SATA controllers operate disabled: Disable the SATA ports [ide]: SATA ports operate as two IDE controllers ahci: SATA ports operate as one 6-port AHCI controller raid: SATA ports form a RAID device
	amcport_2: Select SATA port configuration on AMC port 2 [e-keying]: Enable/disable AMC port 2 via e-keying forced_on: AMC port 2 is always enabled
	amcport_3: Select SATA port configuration on AMC port 3 [e-keying]: Enable/disable AMC port 3 via e-keying forced_on: AMC port 3 is always enabled
	amcport_12: Select SATA port configuration on AMC port 12 [e-keying]: Enable/disable AMC port 12 via e-keying forced_on: AMC port 12 is always enabled **Note:** For non-standard MicroTCA racks, this function must be set to forced_on in order to be able to use the SATA ports.
	amcport_13: Select SATA port configuration on AMC port 13 [e-keying]: Enable/disable AMC port 13 via e-keying forced_on: AMC port 13 is always enabled **Note:** For non-standard MicroTCA racks, this function must be set to forced_on in order to be able to use the SATA ports.
	storageOrom: Launch Storage PCI Option ROMs disabled: Do not launch storage PCI option ROMs. This includes the onboard RAID option ROM. [enabled]: Launch storage option ROMs, if present

kboardconfig

SETTINGS:	`vga:` VGA port configuration `disabled:` Disable VGA port configuration `[enabled]:` Enable VGA port configuration
	`bootvideo:` Select preferred boot video device `amc:` Use video on the AMC port `onboard:` Use onboard graphics
	`wr_prot_eeprom:` System EEPROM write protection `[disabled]:` Do not write protect the system EEPROM `enabled:` System EEPROM is write-protected after POST
	`wr_prot_sata:` Onboard SATA Flash write protection `[disabled]:` Do not write protect the onboard SATA Flash **Warning!** **The SATA Flash module is factory-configured to disabled. Do not change this setting.** `enabled:` This setting is reserved for factory purposes. Do not use this setting.
	`wr_prot_spi:` EFI SPI Flash write protection `[disabled]:` Do not write protect the EFI SPI Flash `enabled:` The EFI SPI Flash is write-protected after POST

kboardinfo

FUNCTION:	Show board identification data
SYNTAX:	`kboardinfo`
DESCRIPTION:	The **kboardinfo** command shows a summary of board-specific identification data. It is especially useful for support queries because it contains this data in a concentrated form.
USAGE:	Show board identification data COMMAND / RESPONSE:

```
Shell> kboardinfo
KOMaOEMF rev.:       3
Board ID:            0xB380
Hardware rev.:       0x0
Logic rev.:          0x1
Boot flash:          Boot flash 0
Geographic address:  3
Material number:
Hardware index:
Serial number:
EFI article name:    SK-EFI-B3801
EFI material number: 1036-5132
EFI index:           12, standard
EFI build time:      11:13:10
EFI build date:      08/17/2010
NorthBridge rev.:    0x10
SouthBridge rev.:    0x6
Microcode:           0xFFFF0002
CPU ID:              0x106E4
CPU Branding:        Intel(R) Xeon(R)CPU
                     C5518 @ 1.73 GHz
```

kboardinfo

SETTINGS:	KOMaOEMF rev.:	Revision of KOMaOEMF protocol
	Board ID:	Kontron board identification value (should be 0xB380 for the AM5030)
	Hardware rev.:	Hardware revision of this board
	Logic rev.:	Logic revision of this board
	Boot flash:	Current boot Flash: either “Boot flash 0” or “Boot flash 1”
	Geographic Address:	Geographic address of the MicroTCA backplane slot the board is currently plugged into
	Material number:	Kontron hardware reference number
	Hardware index:	Kontron hardware index
	Serial number:	This board’s unique serial number
	EFI article name:	Kontron uEFI reference name
	EFI material number:	Kontron uEFI reference number
	EFI index:	Version of this uEFI BIOS
	EFI build time:	Build time of this uEFI BIOS
	EFI build date:	Build date of this uEFI BIOS
	NorthBridge rev.:	Chip revision of the NorthBridge
	SouthBridge rev.:	Chip revision of the SouthBridge (Intel ® 3420)
	Microcode:	Currently loaded microcode
	CPU ID:	CPUID
	CPU Branding:	CPU identification string

kboot

FUNCTION:

Boot a legacy OS
Not to be used for uEFI BootLoaders!

SYNTAX:

```
kboot [-?|-d|-p|-p <path>|-n <name>|-t <type>]
```

where:

?	Show online help
-d	Boot default order
-p <path>	Specify the path to the device to boot from
-n <name>	Specify the device name to boot from
-t <type>	Specify the device type to boot from Available types are: floppy harddrive cdrom network usb-floppy usb-harddrive usb-cdrom

DESCRIPTION:

The **kboot** command boots a legacy OS. Boot device can be selected in a very flexible way. If the requested device is not present, boot returns to shell. The **kboot** command cannot boot native uEFI operating systems. But since these are bootable from shell by calling their bootloader, this is not necessary either. If a requested device is present but not bootable, uEFI continues to boot with the next bootable device in the boot order.

USAGE:

Show all connected devices:

COMMAND / RESPONSE:

```
fs0:\> kboot
____BBS_TABLE_____
00002 network "IBA GE Slot 0100 v1300"
00003 network "IBA GE Slot 0101 v1300"
00004 network "IBA GE Slot 0200 v1300"
00005 network "IBA GE Slot 0201 v1300"
00002 usb-harddrive "SanDisk uSSD 5000 0.1"
Device path: Acpi(PNP0A03,0)/Pci(1A|7)/Usb(1,0)
0001 usb-harddrive "KingstonDataTraveler 2.04.10"
Device path: Acpi(PNP0A03,0)/Pci(1D|7)/Usb(1,0)
```

Boot from device containing the string “Kingston”:

```
fs0:\> kboot -n Kingston
```

Boot from the first device found that is of type floppy:

```
fs0:\> kboot -t floppy
```

kbootnsh

FUNCTION:	Manage the startup script stored in the Flash
SYNTAX:	`kbootnsh [-b] [-?│-g <filename>│-p <filename>│-d]` where: -b Display output page by page -? Show online help -g <filename> Store the current boot script to disk. If there is no physical disk drive present, the **kmkramdisk** command may be used. -p <filename> Store the shell script pointed to by filename to Flash. Note: The shell script cannot be larger then 400 bytes. -d Delete the current startup script from Flash.
DESCRIPTION:	The **kbootnsh** command manages the Flash stored startup script. If the shell is launched by the boot process, it executes a shell script stored in the Flash. If the shell script terminates, the shell executes a **kboot -d** command to continue the boot process. However, the shell script can of course contain any other boot command.

USAGE:	Get current startup script to file named boot.nsh
	`kbootnsh -g boot.nsh`
	Store file named boot.nsh to Flash:
	`kbootnsh -p boot.nsh`
	Delete startup script:
	`kbootnsh -d`

kclearnvram

FUNCTION:	Clear the NVRAM to restore the system's default settings
SYNTAX:	`kclearnvram` No parameters required. For safety reasons this command must be confirmed by pressing "c".
DESCRIPTION:	The **kclearnvram** command allows to clear the system NVRAM. Since all EFI settings are stored inside the NVRAM, the default settings are loaded afterwards.

kclsp

FUNCTION:	Configure clock spreading
SYNTAX:	`kclsp [-?|-d|-e]` where: -? show help -d disable clock spreading -e enable clock spreading
DESCRIPTION:	The **kclsp** command enables or disables clock spreading on the onboard core clock generator. Clock spreading can be used to reduce system EMI.

USAGE:	Get help:
	COMMAND / RESPONSE:
	`Shell> kclsp -?`
	
	`Kontron Clock Spreading Configuration for ICS9LPRS365`
	`-d disable clock spreading`
	`-e enable clock spreading`

kipmi

FUNCTION:	Read or configure available Board Management Controller parameters
SYNTAX:	`kipmi [-?|-b|parameters]` where: -? show online help -b display output page by page parameters fru -- display fru data ipmb -- ipmb bus settings: ipmb [redundant/single] irq -- irq [number]: get/set KCS IRQ mode -- set ipmi controller mode: mode [bmc/smc] net -- display and change mode SOL network settings sel -- handle system event log raw -- execute raw ipmi command rawsendmessage -- execute rawsendmessage ipmi command info -- show information about the device and firmware
DESCRIPTION:	The **kipmi** command can read event logs or can set the Board Management Controller IRQ configuration. This shell application can also be used to set up raw command to the Board Management Controller.

USAGE:	Read or configure available Board Management Controller parameters
	COMMAND / RESPONSE:
	`Display fru`
	`  kipmi fru -b`
	
	`Clear all sel entries`
	`  kipmi sel clear`
	
	`Display sel entry number 3 in hex`
	`  kipmi sel raw 0x03`
	
	`Execute raw command. Ex: Get selftest results`
	`  kipmi raw 0x06 0x00 0x04`
	
	`Change IRQ`
	`  kipmi irq 10`
	
	`Show IRQ configuration`
	`  kipmi irq`

kipmi

SETTINGS:	
	fru [<Fru device ID>]: Displays FRU data Options: **Fru device ID:** Numeric FRU device ID. 0 if FRU is omitted. FRU device 0 is the baseboard's own FRU.
	ipmb: Displays IPMB bus settings **ipmb redundant:** Switch IPMB bus to redundant mode **ipmb single:** Switch IPMB bus to single mode
	Irq <number>: Display/Set the IRQ number of the KCS interface Options: **0:** KCS uses no IRQ **10:** KCS uses IRQ 10 **11:** KCS uses IRQ 11 The board must be reset for the settings to apply.
	Mode <mode>: Display/Set the IPMI controller operating mode Options: **bmc:** IPMI controller operates in BMC mode **smc:** IPMI controller operates in SMC mode
	Net: Set Serial-over-LAN parameters
	Sel: Display system event log Note: The AM5030 does not have a system event log.
	Sensor list|read: Show board sensor data Options: **list:** Display an overview of all available board sensors **read:** Display specific sensor data
	Raw [<bytes> <...>]: Execute raw IPMI command Syntax: **raw [NetFn] [LUN] [COMMAND] ...**
	Rawsendmesage [<bytes> <...>]: Bridge raw IPMI command Syntax: **raw [rsSA] [Channel] [NetFnm] [Lun] [function]...**
	Info: Display IPMI firmware information

kmkramdisk

FUNCTION: Create RAMdisk drives

SYNTAX:

```
kmkramdisk [-?|-s <size> <name>]
```

where:

-?	show help
-s <size> <name>	create a RAMdisk of given size in Megabytes with the mount point name <name>

DESCRIPTION: Creates a RAMdisk of variable size. Can be very useful to perform file operations when no real filesystem is connected to the system.

Note: The RAMdisk loses its mount point name after all drives are remapped by the **map -r** command. The RAMdisk will then be enumerated as any other connected drive and gain a mount point name like “fs0”. This is not a bug of the **kmkramdisk** command but a normal function of the uEFI framework.

USAGE: Create RAMdisk:

COMMAND / RESPONSE:

```
rd:\> kmkramdisk -s 5 myramdisk
Device mapping table
  myramdisk :BlockDevice - Alias (null)
      VenMsg'(93B5F448-127A-4B29-B306-
          5BE8AAC4826E)
Success - Force file system to mount
rd:\> myramdisk:
myramdisk:\> echo testfile > testfile
myramdisk:\> ls
Directory of: myramdisk:\

 05/24/08 04:39a      22 testfile
    1 File(s)         22 bytes
    0 Dir(s)
```

kpassword

FUNCTION:	Control EFI setup and shell passwords
SYNTAX:	`kpassword [-u│-s]` Control EFI setup and shell passwords
DESCRIPTION:	The **kpassword** command is used to get and set the EFI shell and setup passwords. Both user and superuser (Administrator) passwords can be controlled.
USAGE:	`kpassword [-u│-s]` Control EFI setup and shell passwords Parameters: -u Install or change user password -s Install or change superuser password Call without parameters to get current password status Note: Old passwords must be verified if set. Entering an empty password disables the password.

kwdt

FUNCTION: Configure the Kontron onboard Watchdog

SYNTAX:

```
kwdt [-?|-t <timeindex>]
```

where:

-? Show help

-t <timeindex> Configure the Watchdog with the time related to timeindex and activate it with reset routing

Call kwdt -h to obtain a list of timeindex values and related times

DESCRIPTION: The **kwdt** command allows to enable the Kontron onboard Watchdog with reset target before OS boot. This can be used to detect if the OS fails to boot and react by reset. The OS Watchdog driver is required for this functionality to operate.

USAGE: Get help:

COMMAND / RESPONSE:

```
Shell> kwdt -?
-t [time]     - set Timer
value 0    =  125ms
value 1    =  250ms
value 2    =  500ms
value 3    =  1s
value 4    =  2s
value 5    =  4s
value 6    =  8s
value 7    =  16s
value 8    =  32s
value 9    =  64s
value 10   =  128s
value 11   =  256s
value 12   =  512s
value 13   =  1024s
value 14   =  2048s
value 15   =  4096s
```

Set Watchdog to 16 seconds and activate it

COMMAND / RESPONSE (none):

```
Shell> kwdt -t 7
```

Note: Because there is no application which triggers the Watchdog, the system will be reset after 16 seconds in this case. This command should be invoked from a script, followed by an operating system boot, and the OS then has to start triggering the Watchdog.

8.3 uEFI Shell Scripting

8.3.1 Startup Scripting

If the ESC key is not pressed and the timeout is run out, either the Kontron Flash-stored startup is executed, if present, or the uEFI specified `startup.nsh` script located under `\efi\boot\` on any of the attached drives is executed. If none of the startup scripts is present, or the startup script terminates, the default boot order is continued.

If the shell is started with no interaction, it tries to execute some startup scripts automatically. It searches for scripts in the following order:

1. Kontron Flash-stored startup script

2. If there is no Kontron Flash-stored startup script present, the uEFI specified `startup.nsh` script is used. This script must be located on any of the attached FAT formatted disk drives under `\efi\boot\startup.nsh.`

If both startup scripts are absent, the shell terminates and the default boot order is continued.

8.3.2 Create a Startup Script

Startup scripts can be created using the uEFI Shell built-in editor **edit** or under any OS with a plain text editor of your choice. To create a `startup.nsh` type shell script, simply save the script on any FAT-formatted drive attached to the system under `\efi\boot\startup.nsh.` To create a Kontron Flash-stored startup script, the script is to be saved anywhere on a FAT-formatted drive attached to the system and stored to Flash using the built-in uEFI Shell command **kbootnsh**.

8.3.3 Examples of Startup Scripts

8.3.3.1 Automatic Booting from USB Memory Stick

Automatic booting is made from a USB memory stick, if present, otherwise the boot is made from the harddrive.

```
kboot -t usb-harddrive

kboot -t harddrive
```

If neither a USB memory stick nor a harddrive is present, the boot order is continued.

8.3.3.2 Switch On Clock Spreading Prior to Booting from Harddrive

```
kclsp -e

kboot -t harddrive
```

If no harddrive is present, the default order is continued.

8.3.3.3 Execute Shell Script on Other Harddrive

This example executes the shell script named `bootme.nsh` located in the root of the first detected disc drive (`fs0`).

```
fs0:

bootme.nsh
```

Chapter 9

Updating the uEFI BIOS

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9. Updating the uEFI BIOS

BIOS updates are typically delivered as an update CD ISO image. This ISO image needs just to be burned to a CD and booted. Follow the menu for updating the uEFI BIOS. For further information refer to the update CD documentation.

9.1 BIOS Redundancy Strategy

The AM5030 has two sets of EFI Flash chips to form an EFI redundancy strategy. Basic idea behind that is to always have at least one working EFI available regardless if there have been any flashing errors or not.

9.2 Updating Strategy

To always maintain at least one EFI Flash correct, the update CD uses the following update procedure:

1. Switch to the second Flash.
   Since the update CD always changes the Flash chip prior to doing any updates, the uEFI BIOS that was used to actually boot the board and is therefore known to be good is preserved for backup.
2. Update the second Flash.
   This flash is now selected as active boot Flash.

The update CD will not allow to flash both chips at a time. Flashing both chips would destroy the backup version and therefore break the redundancy.

If you want to have the same BIOS version on both Flash chips, then simply run the update CD twice.

9.3 Fallback Mechanism

In case of one EFI being corrupted and therefore the board not starting up, the IPMI controller automatically switches to the other Flash and resets the board. The board should now come up successfully from the other not corrupted image. The flashing procedure can now be restarted to restore the broken image.

9.4 Flash Selection by IPMI Command

Usually the active Flash is selected by the IPMI controller. The Flash bank can be switched via an IPMI OEM command. This command is used by the update CD. See the IPMI manual for further information.

9.5 Flash Selection by DIP Switch

On some cases it may be necessary to force the board to boot from the other Flash without using the appropriate IPMI command to switch the Flash chips. In this case, the onboard DIP switch SW3, switch 2, is used to toggle the active Flash. Note that this switch does not “select” one Flash chip. It toggles the currently active Flash. Therefore, the IPMI controller will still switch the flashes by command or in case of the active Flash is defective. Note that using this DIP switch does not change the way the update CD handles the update procedure. Refer to the AM5030 user guide for further information.

9.6 Determining the Active Flash

Sometimes it may be necessary to check which Flash is active. On the AMI Aptio-based uEFI BIOS, the information is available using the EFI shell command “kboardinfo”. For further information, refer to the “kboardinfo” section in the uEFI Shell chapter of this document.